

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
30 June 2005 (30.06.2005)

PCT

(10) International Publication Number
WO 2005/058929 A1

(51) International Patent Classification⁷: **C07F 17/00**,
C08F 10/00

(21) International Application Number:
PCT/EP2004/014247

(22) International Filing Date:
15 December 2004 (15.12.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
103 60 060.4 19 December 2003 (19.12.2003) DE
60/542,579 5 February 2004 (05.02.2004) US

(71) Applicant (for all designated States except US): **BASELL
POLYOLEFINE GMBH** [DE/DE]; Brühler Strasse 60,
50389 Wesseling (DE).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **CHEVALIER, Rey-
nald** [FR/FR]; 67 rue de l'Aqueduc, F-75010 Paris (FR).
GARCIA, Valerie [FR/FR]; 20, rue Evette, F-60200 Com-
piègne (FR). **MÜLLER, Patrik** [DE/DE]; Am Weiden-
schlag 128, 67071 Ludwigshafen (DE). **SIDOT, Christian**

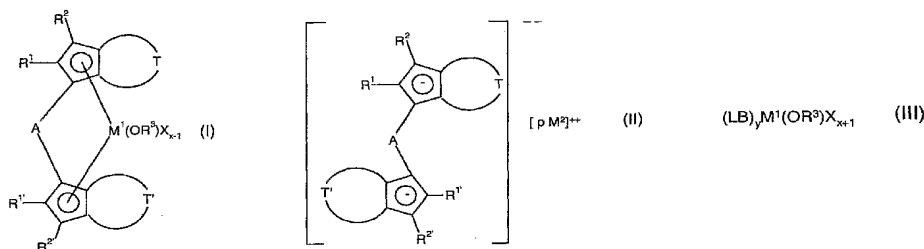
[FR/FR]; 12, Avenue de Landshut, F-60200 Compiègne
(FR). **TELLIER, Christian** [FR/FR]; 9, square Marcel
Forestier, F-60200 Compiègne (FR). **DELANCRAY, Lu-
dovic** [FR/FR]; 1 rue du Flottage, Le Vandy, Apt. 4, 60350
Cuisse-la-Motte (FR).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO,
SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN,
GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: MESO-SELECTIVE SYNTHESIS OF ANSA-METALLOCENES



(57) Abstract: The present invention relates to a process for the meso-selective preparation of ansa-metallocene complexes of the formula (I), which comprises reacting a ligand starting compound of the formula (II) with a transition metal compound of the formula III, where R^1 , R^1 are identical or different and are each hydrogen or an organic radical having from 1 to 40 carbon atoms, R^2 , R^2 are identical or different and are each hydrogen or an organic radical having from 1 to 40 carbon atoms, R^3 is a bulky organic radical which has at least 3 carbon atoms, is bound to the oxygen atom via a nonaromatic carbon or silicon atom and may be substituted by halogen atoms or further organic radicals having from 1 to 20 carbon atoms and may also contain heteroatoms selected from the group consisting of Si, N, P, O and S, T, T' are identical or different and are each a divalent organic group which has from 1 to 40 carbon atoms and together with the cyclopentadienyl ring forms at least one further saturated or unsaturated, substituted or unsubstituted ring system having a ring size of from 5 to 12 atoms, where T and T' may contain the heteroatoms Si, Ge, N, P, As, Sb, O, S, Se or Te within the ring system fused to the cyclopentadienyl ring, A is a bridge consisting of a divalent atom or a divalent group, M¹ is an element of group 3, 4, 5 or 6 of the Periodic Table of the Elements or the lanthanides, the radicals X are identical or different and are each an organic or inorganic radical which is able to be replaced by a cyclopentadienyl anion, x is a natural number from 1 to 4, M² is an alkali metal, an alkaline earth metal or a magnesium monohalide fragment, p is 1 in the case of doubly positively charged metal ions or 2 in the case of singly positively charged metal ions or metal ion fragments, LB is an uncharged Lewis base ligand, and y is a natural number from 0 to 6, and also the subsequent reaction of these complexes to form ansa-metallocenes of the formula (IV), the use of transition metal compounds of the formula (III) for preparing metallocenes and also transition metal compounds of the formula (III), ansa-metallocene complexes of the formula (I) and the use of these as constituents of catalyst systems for the polymerization of olefines.

WO 2005/058929 A1

**Published:**

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.